

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

aSB202
.U6F83
2007

Fugle's Mill Demonstration Site 1985-2006



United States Department of Agriculture
Natural Resources Conservation Service
Plant Materials Center
Bismarck, North Dakota
July 2007

Helping People Help the Land

United States
Department of
Agriculture



NATIONAL
AGRICULTURAL
LIBRARY

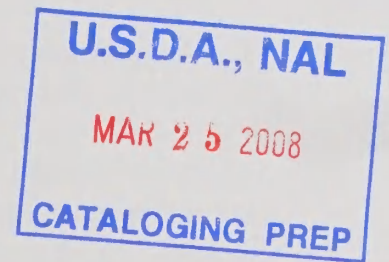
Advancing Access to
Global Information for
Agriculture

Cover photo: Ken Luttner, Mike Knudson, and Dave Breitbach

"The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer."

Fugle's Mill Demonstration Site (1985-2006)

*Compiled by Michael Knudson, Forester
USDA-NRCS Plant Materials Center, Bismarck, North Dakota*



Introduction

Since the formation of the USDA Soil Conservation Service (SCS) in 1935, the agency has been actively involved in plant development. A number of regional nurseries were operated by SCS employees to produce grass seed and trees and shrubs for all types of conservation practices. Nationally, more than 425 million pounds of seed were harvested by SCS nurseries and Soil Conservation Districts in 1950. These SCS nurseries continued to produce large scale quantities of plants and seed until 1953. At that time many of the nurseries were converted to Plant Materials Centers (PMC). The mission of the Plant Materials Program is to provide plant solutions and technology to a wide range of conservation needs.

Objective

The objective is to assemble and evaluate woody plant materials for conservation use in the Northern Great Plains. The goal of this field evaluation planting is to provide, under culture and management, a diversity of long-term testing locations for the comparative field evaluation of new cultivars.

Cooperators

In 1985, the USDA Natural Resources Conservation Service, formerly the Soil Conservation Service, signed a project agreement with the Minnesota Department of Natural Resources, the Olmsted Soil and Water Conservation District, the Hiawatha Valley Resource Conservation and Development Area, and the Southeastern Minnesota Association of Soil and Water Conservation Districts.

Site Description

The Fugle's Mill Demonstration Site is located in the rolling hills southeast of Rochester, Minnesota. Fugle's Mill was built by Mathew Fugle and was in operation from 1850-1874. The demonstration site is across the road from the mill, situated between County Road 1 and the Root River. The legal description is Section 17, Township 105 N., Range 13 W., in Pleasant Grove Township. It is included in Major Land Resource Area 105, the Northern



Mississippi Valley Loess Hills. The elevation is about 1,280 feet above sea level.

Soils

The Mount Carroll series consists of deep, well-drained silt loams. The top 7 inches range from two to three percent organic matter, while the pH is 5.6-7.3. The subsoil pH is 5.1-6.0. Internal drainage is medium. Slopes on the site range from 2 to 18 percent. The soils are in Conservation Tree and Shrub Group 3.

Climate

Climate data is from the official weather station in Rochester, Minnesota. The mean annual precipitation is slightly less than 30 inches. In the period from 1985-1999, the annual precipitation varied from 21.4 inches in 1988 to 43.94 inches in 1990. Seventy-five percent of the annual precipitation falls during the growing season. The mean annual temperature is 43.6 degrees F. This site is in Plant Hardiness Zone 4a.

Warm-Season Grasses

The first phase of plantings made at the Fugle's Mill Demonstration Site was a study of nine species of warm-season grasses. These are grasses that complete most of their growth during the warm part of the year, generally late in the spring and in the summer. They have a different leaf anatomy and use the C₄ photosynthetic pathway to fix carbon. Photosynthesis is the process of combining carbon dioxide from the air with water from the soil to produce sugars and oxygen. C₄ plants are generally able to photosynthesize more productively under high temperatures and high light intensities, with greater water use efficiency. These conditions are typical of much of the tall-grass prairie region.

The nine species included 37 different seed sources (accessions) or cultivars which were planted



in a randomized complete block with three replications, plus an array (see photo on page 3). In the array, the entries were grouped by species. Within each species group, the entries were arranged by maturity, with the earliest maturing accession planted first and the latest maturing accession being last. Each plot was 12 feet wide by 60 feet long. The grasses were planted on June 4-5, 1985. In December

1985, the weather turned quite cold. The average mean temperature for that month was 6.3 degrees F. The normal December mean is 18.5 degrees F. A number of the accessions with southern origins suffered some winter injury. The plots were burned in the spring of 1990 and 1991. The border around each block was mowed annually. Each of the three randomized replications was evaluated from 1985-1991. The data collected included stand rating, vigor, weed contamination, and height. Forage production was calculated for the years 1987-1991. During this period, the precipitation was substantially above normal for 1990 (+14.36) and 1991 (+7.33). The precipitation was below normal for 1987 (-2.63), 1988 (-8.19), and 1989 (-6.85). A number of the entries showed great potential for biomass production. Forage quality was not evaluated at that time. On September 7, 2005, the array of grasses was evaluated for stand and vigor. It is likely that some of the selections had moved to different plots, filling in gaps left by poorly performing entries.

Big Bluestem

Seven entries of big bluestem were compared. The varieties (with origin) were 'Bison' (NDG-4), from central North Dakota; 'Bonilla' (SD-27), from east-central South Dakota; 'Sunnyview' (SD-43), from southeastern South Dakota; 'Champ', from Nebraska; 'Pawnee', from south-central Nebraska; 'Kaw', from east-central Kansas; and 'Rountree', from west-central Iowa.

Sunnyview and Pawnee had the highest average forage yields for the 5-year period, at 1.7 tons per acre. Stand ratings were good to excellent during the 5-year period, except for Kaw, which had winter injury. All entries generally had mature seed at the end of the growing season, except Pawnee, Rountree, and Kaw. At the end of the 2005 growing season, Sunnyview and Rountree had the best vigor.



Sand Bluestem

The varieties 'Garden' and 'Goldstrike' were compared. Both are from Nebraska. Garden was taller and more vigorous over the study period. The forage yield for Garden was twice that of Goldstrike. Garden averaged 1.7 tons per acre. Both entries had poor vigor after the 2005 growing season.

Indiangrass

Five entries of Indiangrass were evaluated. The varieties included 'Tomahawk' (ND-444), from south-central North Dakota and north-central South Dakota; 'Holt', from northeastern Nebraska; 'Oto', from Kansas-Nebraska; 'Osage', from Kansas-Oklahoma; and 'Rumsey', from Illinois. Oto, Osage, and Rumsey had winter injury following the year of establishment. Tomahawk and Holt were the only entries to make mature seed each year that phenology data was collected. Tomahawk and Holt had the highest 5-year average stand ratings. Holt produced 1.2 tons per acre and had the best stand at the end of the 2005 growing season.

Prairie Sandreed

Three entries of prairie sandreed were compared. These selections included PI-477007, from Michigan; ND-95 (Bowman), from southwestern North Dakota; and 'Goshen', from eastern Wyoming. The best performer in all categories was the selection from Michigan. All three entries appeared similar in plant phenology, and had mature seed at the end of the growing season. Forage production for the Michigan entry, with 0.6 tons per acre, was approximately twice that of the other two western selections. The Michigan selection had the best stand after the 2005 growing season.

Switchgrass

Ten entries of switchgrass were evaluated. The accessions included 'Dacotah' (NDG-965-98), from central North Dakota; 'Sunburst', from southeast South Dakota; 'Forestburg' (SD-149), from east-central South Dakota; Neb-28, from north-central Nebraska; 'Summer', from southeast Nebraska; 'Pathfinder', from Nebraska; 'Trailblazer', from Nebraska; 'Cave-in-Rock', from southern Illinois; 'Blackwell', from north-central Oklahoma; and NJ-50, from New Jersey. Summer had the highest average forage production in 1990 and 1991, and also for the 5-year period, at 2.2 tons per acre. Sunburst was the next highest forage producer, with 1.8 tons per acre for these same years. Dacotah had the earliest maturity with mature seed as early as August 29 in 1991. NJ-50 had the poorest 5-year average stand rating. After the 2005 growing season, there was very little difference in vigor between all the switchgrass entries.

Little Bluestem

Four cultivars of little bluestem were compared. The entries included 'Blaze', from Nebraska; 'Camper', from Nebraska; 'Aldous', from Kansas; and 'Cimmaron', a composite from a collection made in Kansas, Colorado, New Mexico and Oklahoma. The average forage yields (1.4 tons per acre) for the 5-year period were comparable, as were stand and vigor ratings. All four entries were late in maturity, due to their southern origin. None of the entries made mature seed during the 4-year period that plant phenology data were collected. Aldous and Cimmaron both showed winter injury the year after establishment. At the end of 2005, Cimmaron had the poorest stand.

Sideoats Grama

Four cultivars of sideoats grama were evaluated. The four entries included 'Killdeer', from western North Dakota; 'Pierre', from central South Dakota; 'Trailway', from northeast Nebraska; and 'Butte', from northeast Nebraska. Trailway had the highest average forage production for the 5-year period. Trailway also had some winter injury the year after establishment. Forage yields for all entries were low, i.e., less than 0.5 tons per acre, except in

1987. All cultivars had mature seed by the end of the growing season. Trailway had the best stand after the 2005 growing season.

Eastern Gamagrass

One entry of eastern gamagrass, K-24, from Kansas, was evaluated. Stand density averaged one plant per square foot, although all plots had large open areas between plants. Forage production was not good, averaging less than 0.5 tons per acre in 1990 and 1991. Some dead crowns were also identified in the plots in 1991. Limited seed culms were produced in the plots, though maturity was early and mature seed was documented in late August.

Caucasian Bluestem

One entry of Caucasian bluestem, PI-78758, from central Asia, was evaluated. Severe winter injury was documented the first year after establishment. The remaining plants did recover and the 5-year average forage yield was close to 1.5 tons per acre. More than 2.5 tons per acre were harvested in 1988. Mature seed was recorded at the end of the growing season during all years evaluated, except 1990. By 2005, this entry had died out.

Trees and Shrubs

One of the principal tasks of the Plant Materials Center has always been tree improvement. This has involved seed source studies, selection of superior plants, progeny testing, and the establishment of seed orchards. Some of the new tree and shrub species that the PMC began evaluating in the 1950s were grown from seed collected at the Agriculture and Agri-Food Canada Arboretum in Morden, Manitoba. Many new plants were made available to soil conservation districts for windbreaks from these Canadian collections.

In the spring of 1986, a selection of these promising woody plants was established in the Off-Center Evaluation Planting at Fugle's Mill. The PMC staff, with the assistance of the NRCS Area Office and State Office staff, as well as the Olmsted County Soil and Water Conservation District personnel annually added new plants until 1995. A complete list of all species and accessions that were planted is recorded in **Table 2**.

The trees and shrubs planted were provided by private nurseries and other USDA agencies. A number of the accessions came from other countries, often by way of the Plant Introduction Stations operated by the USDA Agricultural Research Service. In the period from 1986-1995, a total of 137 different accessions of 96 different species were planted. There were often great differences in performance between different accessions within a species. Only by observing these plants over a number of years at several locations, is it possible to find the best plants for conservation use.

Planting Plan

The plots were not randomized or replicated but systematically arranged for ease of evaluation and demonstration purposes. In Block I, the woody plants were planted on the contour in long rows. Block II consisted of shrubs; Block III poplars; while Block IV consisted of willows. Black walnut was planted as a border around Block I. Due to the sloping terrain, the land between the rows was left in the previous cover of grass and alfalfa.

Plot Maintenance

The grass strips between the tree rows have been mowed. For several years, a mechanical cultivator was used to control the grass growing around the trees. Starting in 1988, the herbicide Casaron® was applied each fall for several years. Damaged plants have been removed. Since the trees were first planted, conservationists' perceptions of what are desirable plants has changed. The use of the term 'invasive' has become very common, though not

all agree on the definition. Some of the woody plants established in the 1980s have spread by birds using the fruit. In May 2006, a work crew removed the autumn olive. The autumn olive plants were cut to the ground and treated with the herbicide, Garlon® and/or glyphosate.



Evaluations and Results

Information on planting date, survival, vigor, canopy width, and plant height were recorded starting in 1986. In the fall, measurements were taken on selected plants. The plants were evaluated annually until 1999. An evaluation schedule, based on year of planting, was followed for each accession. Species have remained the same since 1999. These plants are shown on **Table 3**.

In the 20 years since the planting was established, the extremes of temperature and precipitation, combined with the pressure from the competing grass cover, has had an effect on plant survival. One of the key measures of performance is plant vigor, which is a combination of plant form and plant health. In May 2006, a quick review of the trees was made. Some of the trees and shrubs are doing very well. The accessions that show better than average vigor are listed in **Table 1**.

Table 1: Best Performing Plants

'Midwest' crabapple	9063143 red Tatarian honeysuckle
'Imperial' poplar	ND-3779 Siberian pea shrub
ND-3803 white poplar	'Meadowlark' forsythia
9063130 river birch	ND-1879 honey locust
ND-1729 Siberian larch	Clone C austree
9057413 ponderosa pine	'Streamco' willow
ND-2502 ponderosa pine	'Flame' Amur maple
9057426 Douglas fir	ND-629 Amur maple
9058862 tamarack	

Since 1973, the Bismarck PMC has released 14 varieties of woody plants. Most of those species were included in the planting. Information gathered from evaluation of these plants was used to help support their release. In recent years, some of the released plants have declined in vigor. The 'McDermand' Ussurian (Harbin) pear, 'Cardan' green ash, and 'Midwest' Manchurian crabapple continue to show average or better vigor.



Table 2. Planting Record of Woody Species at Fugle's Mill Demonstration Site (Study 38I340K Field Evaluation of Woody Plant Materials, Rochester, Minnesota)						
Scientific Name	Accession	Common Name	Year Planted	Year Removed	Origin/Source	
<i>Acer ginnala</i>	ND-629	Amur maple	1986		Asia/Morden, MB	
	'Flame'	Amur maple	1986		Asia/PMC, Elsberry, MO	
<i>Acer negundo</i>	9058864	boxelder	1986		Lincoln-Oakes Nursery, Bismarck, ND	
<i>Acer saccharinum</i>	ND-3825	silver maple	1986		Burleigh Co., ND	
<i>Acer saccharum</i>	9063131	sugar maple	1993	1997	SD/Smith Nursery, Charles City, IA	
<i>Aesculus glabra</i>	9047239	buckeye	1986		Bismarck, ND (Haas)	
<i>Amelanchier alnifolia</i>	ND-3767	juneberry	1986		Lincoln-Oakes Nursery, Bismarck, ND	
<i>Amorpha fruticosa</i>	9047236	false indigo	1987		Burleigh Co., ND/Lincoln-Oakes Nursery, Bismarck, ND	
	9008041	false indigo	1987		PMC, Aberdeen, ID	
<i>Aronia melanocarpa</i>	323957	chokeberry	1988		Russia/ARS, Ames, IA	
<i>Berberis koreana</i>	ND-3744	Korean barberry	1988		Asia/ND SU, Fargo, ND	
<i>Betula nigra</i>	9063130	river birch	1993		MN Forestry Assn.	
<i>Betula papyrifera</i>	9063129	paper birch	1993		MN Forestry Assn.	
	9057405	paper birch	1988		Bottineau Co., NDFS Nursery, Towner, ND	
<i>Caragana arborescens</i>	ND-3749	caragana	1986		Lincoln-Oakes Nursery, Bismarck, ND	
<i>Caragana pygmaea</i>	ND-2507	pygmy caragana	1988		Asia/Bottineau, ND	
<i>Celtis occidentalis</i>	'Oahe'	hackberry	1986		SD/ARS, Mandan, ND	
	ND-3756	hackberry	1986		Lincoln-Oakes Nursery, Bismarck, ND	
	9057410	hackberry	1988		Denbigh, ND/NDFS, Towner, ND	

<u>Scientific Name</u>	<u>Accession</u>	<u>Common Name</u>	<u>Year Planted</u>	<u>Year Removed</u>	<u>Origin/Source</u>
<i>Cornus amomum</i>	'Indigo'	silky dogwood	1986		PMC, Rose Lake, MI
<i>Cornus sericea</i>	ND-3754	redosier dogwood	1986		Lincoln-Oakes Nursery, Bismarck, ND
<i>Corylus</i> x	9076683	hybrid hazel	1995	1997	Badgersett Nursery, Preston, MN
	9076684	hybrid hazel	1995	1997	Badgersett Nursery, Preston, MN
<i>Corylus americana</i>	9057409	American hazel	1988		Bottineau Co., ND/NDFS, Towner, ND
<i>Cotoneaster acutifolia</i>	ND-3751	Peking cotoneaster	1986		Lincoln-Oakes Nursery, Bismarck, ND
<i>Cotoneaster integerrimus</i>	ND-177	European cotoneaster	1986		Asia/ARS, Cheyenne, WY
<i>Crataegus</i> sp.	ND-1567	native hawthorn	1988	1995	Wells Co., ND
<i>Crataegus</i> x <i>anomala</i>	'Homestead'	Arnold hawthorn	1988		Morden, MB
<i>Elaeagnus angustifolia</i>	ND-3759	Russian olive	1986	1995	Russia/Lincoln-Oakes Nursery, Bismarck, ND
	'King Red'	Russian olive	1987	1990	Russia/PMC, Tucson, AZ
<i>Elaeagnus umbellata</i>	'Elsberry'	autumn olive	1990	1993	China/PMC, Elsberry, MO
	'Redwing'	autumn olive	1986		China/PMC, Rose Lake, MI
	'Cardinal'	autumn olive	1986		China/PMC, Big Flats, NY
<i>Forsythia europaea</i> x <i>ovata</i>	'Meadowlark'	forsythia	1989		Arnold Arboretum/NDSU, Fargo, ND
<i>Fraxinus americana</i>	9063127	white ash	1992		WI/Lincoln-Oakes Nursery, Bismarck, ND
<i>Fraxinus nigra</i>	9063116	black ash	1995		Itasca State Park, MN
<i>Fraxinus pennsylvanica</i>	ND-3757	green ash	1986		Lincoln-Oakes Nursery, Bismarck, ND
	'Cardan'	green ash	1986		MT/ARS, Mandan, ND
	9063115	green ash	1995		Itasca State Park, MN

Scientific Name	Accession	Common Name	Year Planted	Year Removed	Origin/Source
<i>Gleditsia triacanthos</i>	ND-1879	honeylocust	1986		Woodward, OK
	9063124	honeylocust	1995	1999	Codington Co., SD/Big Sioux Nursery, SD
<i>Juglans nigra</i>	9063098	black walnut	1991		Big Sioux Nursery, Watertown, SD
<i>Larix laricina</i>	9058862	tamarack	1990		Chippewa Farms, MN
<i>Larix sibirica</i>	ND-1729	Siberian larch	1986		Asia/NDFS, Towner, ND
<i>Lonicera maackii</i>	ND-11	Amur honeysuckle	1987		Asia/Morden, MB
	'Cling-Red'	Amur honeysuckle	1987		Asia/PMC, Elsberry, MO
	'Rem-Red'	Amur honeysuckle	1987		Asia/Cape May, NJ
<i>Lonicera tatarica</i>	9069080	Tatarian honeysuckle	1993		Asia/Lee Nursery, Fertile, MN
	9063143	Tatarian honeysuckle	1993		Asia/Schumacher Berry Farm, MN
	9069128	Tatarian honeysuckle	1995		Asia/Big Sioux Nursery, Watertown, SD
	ND-3755	Tatarian honeysuckle	1986		Asia/Lincoln-Oakes Nursery, Bismarck, ND
<i>Lonicera tatarica sibirica</i>	ND-313	Tatarian honeysuckle	1986		Asia/ARS, Cheyenne, WY
<i>Lonicera xylosteoides</i>	'Hedge King'	honeysuckle	1988		Asia/Wedge Nursery, Albert Lea, MN
<i>Malus</i>	'Magenta'	crabapple	1992		PMC, Rose Lake, MI
<i>Malus baccata</i>	ND-3765	Siberian crabapple	1986		Asia/Lincoln-Oakes Nursery, Bismarck, ND
	'Red Splendor'	Siberian crabapple	1988		Lee Nursery, Fertile, MN
<i>Malus mandshurica</i>	'Midwest'	Manchurian crabapple	1986		Asia/Morden, MB
<i>Malus sargentii</i>	'Roselow'	Sargent's crabapple	1986	1992	PMC, Rose Lake, MI
<i>Morus rubra</i>	ND-2105	red mulberry	1988		Big Stone Co., MN
<i>Phellodendron sachalinense</i>	9063148	corktree	1995		Clay Co., MN shelterbelt

<u>Scientific Name</u>	<u>Accession</u>	<u>Common Name</u>	<u>Year Planted</u>	<u>Year Removed</u>	<u>Origin/Source</u>
<i>Picea abies</i>	ND-3791	Norway spruce	1986		Europe/U of M, St. Paul, MN
<i>Picea mariana</i>	9058847	black spruce	1989		U of Minnesota
<i>Pinus ponderosa</i>	9057413	ponderosa pine	1988		MT/NDFS, Bottineau, ND
	9047223	ponderosa pine	1986		NDFS Nursery, Towner, ND
<i>Platanus occidentalis</i>	9069088	sycamore	1993	1999	TEC, Osseo, MN
<i>Populus</i>	14390 (Canam)	hybrid Walker poplar	1991		ARS, Mandan, ND
	14392(Manitou)	hybrid Walker poplar	1991	1997	ARS, Mandan, ND
	'Theves'	hybrid poplar	1993	1999	Lee Nursery, Fertile, MN
	9063146	hybrid Walker poplar	1993	1997	PFRA, Indianhead, SK
	'Raverdeau'	hybrid poplar	1993	1998	Lee Nursery, Fertile, MN
	'Assiniboine'	hybrid poplar	1993	1997	PFRA, Indianhead, SK
<i>Populus alba</i>	ND-3803	white poplar	1986		Turner Co., SD/PMC, Bismarck, ND
<i>Populus canadensis eugenei</i>	'Imperial'	hybrid poplar	1986		PMC, Rose Lake, MI
	ND-3780	hybrid poplar	1986		Lincoln-Oakes Nursery, Bismarck, ND
<i>Populus deltoides</i>	9063141	native cottonwood	1993	1998	Lincoln-Oakes Nursery, Bismarck, ND
<i>Populus deltoides x balsamifera</i>	Northwest	hybrid poplar	1986		Lincoln-Oakes Nursery, Bismarck, ND
<i>Populus deltoides x nigra</i>	14271	Walker poplar	1991		ARS, Mandan, ND
	14272	Walker poplar	1991		ARS, Mandan, ND
	14273	Walker poplar	1991		ARS, Mandan, ND
	14274	Walker poplar	1991		ARS, Mandan, ND
<i>Populus deltoides siouxlandii</i>	ND-3761	Siouxland Cottonwood	1986		Lincoln-Oakes Nursery, Bismarck, ND
<i>Populus robusta</i>	ND-3781	robusta poplar	1986		Lincoln-Oakes Nursery, Bismarck, ND
<i>Populus tremuloides</i>	9069090	quaking aspen	1993		Lee Nursery, Fertile, MN

<u>Scientific Name</u>	<u>Accession</u>	<u>Common Name</u>	<u>Year Planted</u>	<u>Year Removed</u>	<u>Origin/Source</u>
<i>Prunus</i>					
	'Prairie Red'	select plum	1986		Hand Co., SD
	9063142	Japanese cherry	1993	1997	Lincoln-Oakes Nursery, Bismarck, ND
<i>Prunus americana</i>					
	514677	native plum	1990		PMC, Manhattan, KS
	ND-3753	native plum	1986		Lincoln-Oakes Nursery, Bismarck, ND
<i>Prunus angustifolia</i>					
	9049970	chickasaw plum	1990		PMC, Manhattan, KS
<i>Prunus armeniaca</i>					
	ND-2470	apricot	1986		Lincoln-Oakes Nursery, Bismarck, ND
	ND-2102	apricot	1986		Asia/Hand Co., SD
<i>Prunus fruticosa</i>					
	'Scarlet'	Mongolian cherry	1986		Asia/Morden, MB
<i>Prunus maackii</i>					
	9069129	Amur chokecherry	1995	1999	Asia/Big Sioux Nursery, Watertown, SD
<i>Prunus padus</i>					
	SD-131	mayday	1986		Asia/Moody Co., SD
<i>Prunus pumila besseyi</i>					
	ND-3894	sandcherry	1986		Lincoln-Oakes Nursery, Bismarck, ND
<i>Prunus tenella</i>					
	'Regal'	Russian almond	1986		ND Game & Fish/Lincoln-Oakes Nursery, Bismarck, ND
<i>Prunus tomentosa</i>					
	ND-3760	Nanking cherry	1986		Lincoln-Oakes Nursery, Bismarck, ND
<i>Prunus virginiana</i>					
	'Schubert'	chokecherry	1986		ARS, Mandan, ND
	ND-1868	chokecherry	1986		Lincoln-Oakes Nursery, Bismarck, ND
<i>Pseudotsuga menziesii</i>					
	9057426	Douglas fir	1986		U of M, St. Paul, MN
<i>Pyrus ussuriensis</i>					
	'McDermard'	Ussurian (Harbin) pear	1986		Manchuria/Morden, MB
<i>Quercus alba</i>					
	9069084	white oak	1993		Lee Nursery, Fertile, MN
<i>Quercus ellipsoidalis</i>					
	9069082	pin oak	1993		Lee Nursery, Fertile, MN

Scientific Name	Accession	Common Name	Year Planted	Year Removed	Origin/Source
<i>Quercus macrocarpa</i>	9057412	bur oak	1988	1995	Foster Co., ND/NDFS, Towner, ND
	K-1407	bur oak	1990	1994	PMC, Manhattan, KS
<i>Quercus robur</i>	9069089	English oak	1993		TEC, Osseo, MN
<i>Quercus rubra</i>	9069083	red oak	1993	1995	Lee Nursery, Fertile, MN
<i>Rhus aromatica</i>	'Konza'	aromatic sumac	1986	1992	PMC, Manhattan, KS
<i>Rhus trilobata</i>	'Bighorn'	skunkbush sumac	1986		Bighorn Co., WY
	'Autumn Amber'	skunkbush sumac	1987		
<i>Ribes odoratum</i>	ND-3763	golden currant	1986		Lincoln-Oakes Nursery, Bismarck, ND
<i>Salix</i>	ND-3773	willow	1986		Norman Co., MN
<i>Salix acutifolia</i>	9047242	sharp-leaf willow	1986		Lincoln-Oakes Nursery, Bismarck, ND
<i>Salix alba</i>	ND-3772	white willow	1986		Lincoln-Oakes Nursery, Bismarck, ND
<i>Salix alba</i> var. <i>chermesina</i>	9057447	red stem willow	1986		Lincoln-Oakes Nursery, Bismarck, ND
<i>Salix alba</i> var. <i>vitellina</i>	ND-3769	golden willow	1986		Lincoln-Oakes Nursery, Bismarck, ND
<i>Salix cotteti</i>	434285	Bankers dwarf willow	1986	1993	USDA, PMC, Quicksand, KY
<i>Salix matsudana</i> x <i>alba</i>	9058896 (C)	Austree	1990		Austree Inc., Pescadero, CA
	9058899	Austree	1991		Austree Inc., Pescadero, CA
	9058897	Austree	1991	1992	
<i>Salix pentandra</i>	Mich-433	laurel leaf willow	1986		Europe/PMC, Rose Lake, MI
	9057448	laurel willow	1986		
<i>Salix purpurea</i>	'Streamco'	purple osier willow	1986		Europe/PMC, Big Flats, NY

<u>Scientific Name</u>	<u>Accession</u>	<u>Common Name</u>	<u>Year Planted</u>	<u>Year Removed</u>	<u>Origin/Source</u>
<i>Shepherdia argentea</i>	'Sakakawea'	silver buffaloberry	1986		Morden, MB
	ND-3764	silver buffaloberry	1986		Lincoln-Oakes Nursery, Bismarck, ND
<i>Syringa pekinensis</i>	ND-686	Pekin lilac	1986		Asia/Lincoln-Oakes Nursery, Bismarck, ND
<i>Syringa villosa</i>	'Legacy'	late lilac	1986		China/Morden, MB
<i>Thuja occidentalis</i>	ND-3787	northern white cedar	1986		U of M, St. Paul, MN
<i>Tilia cordata</i>	9069081	littelleaf linden	1993		Europe/Lee Nursery, Fertile, MN
<i>Ulmus japonica</i>	9063126	Japanese elm	1992	1998	Manchuria/PFRA, Indianhead, SK
<i>Ulmus parvifolia</i>	'Elsmo'	Chinese lacebark elm	1990	1992	Asia/PMC, Elsberry, MO
<i>Viburnum lentago</i>	ND-21	nannyberry	1986		ARS, Mandan, ND
<i>Viburnum opulus</i>	399414	European cranberry	1988		Yugosllovakia/ARS, Ames, IA
<i>Viburnum trilobum</i>	9031856	American cranberrybush	1986		USDA, PMC, Rose Lake, MI
	9031878	American cranberrybush	1986		WI/USDA, PMC, Rose Lake, MI

Key to Table 3. Evaluation Data of Woody Species at Fugle's Mill Demonstration Site (Study 38I340K Field Evaluation of Woody Plant Materials, Rochester, Minnesota)

- PLOT LOCATION = plot location of the plant material within the evaluation
- ACCESSION NUMBER = any accession number, PI number or cultivar name assigned to the plant material
- PLANT SYMBOL = plant symbol of the genus and species
- GENUS/SPECIES = common name and scientific name of the plant material
- ORIGIN/SOURCE = origin and/or source of the plant material
- TRANS DATE = month and day the plant material was transplanted at the evaluation site
- YR PLT = year the plant materials were transplanted at the evaluation site
- YR REC = year of record
- MATL PLTD = type of material planted, PLBR = bareroot, CONT = containerized
- NO PLTS = number of plants planted in the plot
- NO SRV = number of plants surviving
- PCT SRV = percent of plants surviving
- VI = plant vigor (1=excellent, 3=good, 5=fair, 7=poor, 9=very poor)
- CAN COV (ft) = canopy cover measured in feet
- PLT HT (ft) = plant height measured in feet

Table 3.

Project No.: 38I340K Field Evaluation of Woody Plant Materials, Rochester, Minnesota
Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD	NO PLTS	NO SRV	PCT SRV	VI	CAN COV	PLT HT	REMARKS
I/1/1-20	ND-313 PI-477999	LOTA	red Tatarian honeysuckle	13-May	86	86	PLBR	20	19	95		40	56	
			<i>Lonicera tatarica</i>			87			11	55	7	25	46	
			USDA, NRCS, PMC, Bismarck, ND			88			10	50	6	31	46	
						91			9	45	6	172	173	
						92			9	45	5	158	174	
						95			6	32	4	247	238	
I/1/21-40	ND-3755 9019597	LOTA	red Tatarian honeysuckle	13-May	86	86	PLBR	20	20	100		28	44	
			<i>Lonicera tatarica</i>			87			14	70	6	23	53	
			Lincoln-Oakes Nursery, Bismarck, ND			88			15	75	6	36	58	
						91			11	55	7	110	151	
						92			14	70	6	92	113	
						95			14	70	6	146	173	all have leaf blight
I/1/41-60	ND-11 PI-477998	LOMA	Amur honeysuckle	11-May	87	87	CONT	20	19	95	3	20	29	
			<i>Lonicera maackii</i>			88			17	85	4	27	39	
			USDA, NRCS, PMC, Bismarck, ND			89			19	95	3	80	64	
						91			19	95	4	257	249	
						92			16	80	2	158	165	
						95			16	80	4	180	201	
I/1/61-80	'Rem-Red' PI-421135	LOMA	Amur honeysuckle	11-May	87	87	PLBR	20	18	90	4	17	34	
			<i>Lonicera maackii</i>			88			20	100	3	38	53	
			USDA, NRCS, PMC, Cape May, NJ			89			20	100	2	106	95	
						91			19	95	3	235	202	
						93			15	75	2	290	242	
						96			19	95	3	249	251	dieback on 2,5,10
I/1/81-100	'Cling-Red' PI-483450	LOMA	Amur honeysuckle	11-May	87	87	PLBR	20	19	95	3	27	50	
			<i>Lonicera maackii</i>			88			19	95	2	58	77	
			USDA, NRCS, PMC, Cape May, NJ			89			19	95	1	144	135	
						91			19	95	4	236	217	
						93			19	95	3	295	260	
						96			19	95	6	268	275	dieback on 6,11,15-19

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD	NO PLTS	NO SRV	PCT SRV	CAN COV	PLT HT	REMARKS
I/1/101-120	ND-3754 9019580	COST4	redosier dogwood <i>Cornus stolonifera</i> Lincoln-Oakes Nursery, Bismarck, ND	13-May	86	86	PLBR	20	20	100	31	64	
						87			20	100	3	96	
						88			20	100	2	100	
						90			20	100	3	145	
						92			20	100	3	184	
						95			20	100	4	208	
I/1/121-140	'Indigo' PI-468117	COAM2	silky dogwood <i>Cornus amomum</i> USDA, NRCS, PMC, East Lansing, MI	13-May	86	86	PLBR	20	19	95	34	55	
						87			20	100	4	57	
						88			18	90	4	57	
						90			17	85	3	113	
						92			16	80	4	155	heavy deer browse on plt 18-20
						95			16	80	3	199	
I/1/141-160	'Cardinal' PI-421800	ELUM	autumn olive <i>Elaeagnus umbellata</i> USDA, NRCS, PMC, Big Flats, NY	13-May	86	86	PLBR	20	19	95	14	35	
						87			10	50	5	40	
						88			9	45	4	48	
						90			20	100	5	96	
						92			19	95	6	142	herbicide damage,
						95			18	90	5	271	90% of plants have dieback
I/1/161-180	'Redwing' PI-477008	ELUM	autumn olive <i>Elaeagnus umbellata</i> USDA, NRCS, PMC, East Lansing, MI	13-May	86	86	PLBR	20	16	80	22	40	
						87			15	75	4	59	
						88			19	95	4	67	
						90			19	95	3	178	
						92			19	95	6	202	
						95			17	85	7	253	
I/1/181-190	Arnolds Red 9069080	LOTA	red Tatarian honeysuckle <i>Lonicera tatarica</i> Lee Nursery, Fertile, MN	29-Apr	93	93	PLBR	9	9	100	5	25	
						94			9	100	3	76	
						95			9	100	3	142	
						97			9	100	5	206	
						99			9	100	4	235	
I/1/191-200	9063143	LOTA	red Tatarian honeysuckle <i>Lonicera tatarica</i> Iowa Lincoln-Oakes Nursery, Bismarck, ND	29-Apr	93	93	PLBR	10	9	90	4	42	heavy bromegrass competition
						94			8	80	5	61	
						95			10	100	2	90	
						97			10	100	4	126	
						99			10	100	5	157	

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLID	NO PLIS	NO SRV	PCT SRV	VI	CAN COV	PLT HT	REMARKS
I/1/201-220	ND-3751 9019581	COAC*	cotoneaster <i>Cotoneaster acutifolia</i> Lincoln-Oakes Nursery, Bismarck, ND	13-May	86	86	PLBR	20	20	100		24	40	
						87			11	55	4	19	42	
						88			19	95	4	22	42	
						90			18	90	3	117	124	
						92			16	80	5	124	156	
						95			14	70	2	160	213	
I/2/1-20	'Centennial' ND-177 9005729	COIN16	European cotoneaster <i>Cotoneaster integerrimus</i> USDA, ARS, Cheyenne, WY USDA, NRCS, PMC, Bismarck, ND	13-May	86	86	CONT	20	19	95		59	70	
						87			6	30	4	42	74	
						88			18	90	6	29	39	
						90			18	90	3	146	134	
						92			18	90	3	198	168	
						95			18	90	3	231	208	
I/2/21-40	ND-3767 9019576	AMAL2	serviceberry <i>Amelanchier alnifolia</i> Lincoln-Oakes Nursery, Bismarck, ND	13-May	86	86	PLBR	20	20	100		22	40	
						87			8	40	5	22	47	
						88			16	80	6	24	44	
						90			17	85	6	42	58	
						92			16	80	6	57	61	deer browse on larger plants
						95			15	75	5	69	82	deer browse on all
I/2/41-50	9063142	PRUNU	Japanese cherry <i>Prunus</i> Bottineau FEP, ND Lincoln-Oakes Nursery, ND	29-Apr	93	93	PLBR	10	9	90	3	26	47	
						94			9	90	5	30	54	
						95			9	90	4	54	67	
						97			4	40	6	50	55	
						99			0	0				
I/2/51-60	9069128	LOTA	red Tatarian honeysuckle <i>Lonicera tatarica</i> Big Sioux Nursery, Watertown, SD	25-Apr	95	95	CONT(P)	10	10	100	4	26	41	
						96			9	90	4	29	71	
						97			8	80	5	43	82	
						99			9	90		48	96	
I/2/61-80	'Bighorn' PI-483445	RHTR	skunkbush sumac <i>Rhus trilobata</i> USDA, NRCS, PMC, Los Lunas, NM	11-Jun	86	86	PLBR	20	18	90		13	34	
						87			7	35	7	9	27	
						88			14	70	6	20	59	
						90			18	90	5	74	100	
						92			18	90	5	102	117	
						95			18	90	5	122	149	

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD	NO PLTS	NO SRV	PCT SRV	VI	CAN COV	PLT HT	REMARKS
I/2/81-100	'Autumn Amber' 9009467	RHTR	skunkbush sumac <i>Rhus trilobata</i> USDA, NRCS, PMC, Los Lunas, NM	12-May	87	87	PLBR	4	2	50	6	15	20	
						89			4	100	3	39	60	
						90			4	100	5	63	78	
						91			4	100	5	80	97	
						93			3	75	6	83	113	
						96			1	25	8	115	215	dieback on #3
I/2/101-120	'Scarlet' PI-478003	PRFR2	Mongolian cherry <i>Prunus fruticosa</i> Res. Sta., Morden, MB, CA USDA, NRCS, PMC, Bismarck, ND	13-May	86	86	PLBR	20	17	85		15	34	
						87			5	25	6	17	34	
						88			16	80	6	15	27	
						90			13	65	5	43	43	
						92			11	55	5	44	47	severe rabbit damage, deer
						95			11	55	6	40	50	
I/2/121-140	ND-3894 9035204	PRPUB	sandcherry <i>Prunus pumila besseyi</i> Lawyer Nursery, Plains, MT USDA, NRCS, PMC, Bismarck, ND	13-May	86	86	CONT	20	20	100		18	40	
						87			10	50	7	20	42	
						88			9	45	3	37	48	
						90			17	85	4	74	74	
						92			17	85	4	70	79	moderate to severe deer browse
						95			16	80	6	70	87	
I/2/141-160	ND-3760 9019606	PRTO*	nanking cherry <i>Prunus tomentosa</i> Lincoln-Oakes Nursery, Bismarck, ND	13-May	86	86	PLBR	20	14	70		23	47	
						87			10	50	4	22	46	
						88			19	95	5	29	58	
						90			19	95	3	117	128	
						92			18	90	4	117	151	
						95			17	85	5	131	168	
I/2/161-180	'Regal' ND-283 9006079 PI-540442	PRTE*	Russian almond <i>Prunus tenella</i> USDA, NRCS, PMC, Bismarck, ND	13-May	86	86	CONT	9	9	100		26	51	
						87			1	11	3	25	70	
						88			8	80	7	13	36	
						90			10	100	3	78	94	
						92			8	80	4	98	122	pocket gopher
						95			8	80	3	91	133	

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD	NO PLTS	NO SRV	PCT SRV	CAN COV	PLT HT	REMARKS
I/2/181-200	ND-3749 9019579	CAAR18	Siberian pea shrub <i>Caragana arborescens</i> Lincoln-Oakes Nursery, Bismarck, ND	13-May	86	86	PLBR	20	18	100	12	51	
						87			17	90	21	74	
						88			20	85	37	90	
						90			19	100	78	150	
						92			17	95	112	195	seed production on all
						95			17	85	173	251	
I/2/200-220	9031878	VITR8	American cranberrybush <i>Viburnum trilobum</i> USDA, NRCS, PMC, East Lansing, MI	13-May	86	86	PLBR	18	16	89	24	20	
						87			15	83	16	26	
						88			15	83	26	35	
						90			11	55	67	68	
						92			11	55	99	114	
						95			12	60	108	134	
I/3/1-10	'Magenta' PI-514275	MALUS	crabapple <i>Malus</i> USDA, NRCS, PMC, East Lansing, MI	29-Apr	92	92	PLBR	10	9	90	12	34	placed Tubex on all *tree shelter test
						93			8	80	*	62	
						94			8	80	24	75	
						96			8	80	34	81	deer browse on 3-6,8,10
						98			7	70	35	86	tip die-off on 2
I/3/11-20	'Midwest' PI-478000	MAMA37	Manchurian crabapple <i>Malus mandshurica</i> Res. Sta., Morden, MB, CA Lincoln-Oakes Nursery, Bismarck, ND	13-May	86	86	PLBR	10	10	100	34	76	
						87			9	90	47	86	
						88			9	90	95	113	
						90			9	90	156	199	
						92			9	90	197	268	moderate deer browse on all
						95			9	90	309	390	
I/3/21-30	'Red Splendor' 9006004	MABA	crabapple <i>Malus baccata</i> Lee Nursery, Fertile, MN	3-May	88	88	PLBR	10	10	100	12	50	
						89			10	100	33	59	
						90			10	100	50	79	
						92			10	100	66	98	severe deer browse
						95			10	100	128	164	severe deer browse on all
						97			7	70	130	191	

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD	NO PLTS	NO SRV	PCT SRV	VI	CAN COV	PLT HT	REMARKS
I/3/31-40	ND-3765 9019598	MASt*	Siberian crabapple <i>Malus baccata</i> Lincoln-Oakes Nursery, Bismarck, ND	13-May	86	86	PLBR	10	10	100	4	24	59	
						87			6	60	4	32	77	
						88			7	70	3	37	54	
						90			7	70	4	101	108	
						92			7	70	4	114	166	severe deer browse on all
						95			7	70	3	158	254	
I/3/41-50	'Flame' PI-483442	ACGI	Amur maple <i>Acer ginnala</i> USDA, NRCS, PMC, Elsberry, MO	13-May	86	86	PLBR	10	1	10		15	35	
						87			10	100	3	18	50	
						88			10	100	3	37	64	
						90			8	80	4	128	134	
						92			8	80	4	181	190	
						95			8	89	4	237	282	
I/3/51-60	ND-629 PI-477992	ACGI	Amur maple <i>Acer ginnala</i> USDA, NRCS, PMC, Bismarck, ND	13-May	86	86	CONT	10	10	100		32	60	
						87			10	100	4	27	59	
						88			10	100	3	57	77	
						90			10	100	4	130	151	
						92			10	100	4	176	230	
						95			10	100	3	247	306	
I/3/61-70	ND-1868 9006092	PRVI	chokecherry <i>Prunus virginiana</i> Lincoln-Oakes Nursery, Bismarck, ND	13-May	86	86	PLBR	10	8	80		14	48	
						87			8	80	5	15	50	
						88			10	100	3	32	60	
						90			10	100	4	95	137	
						92			10	100	4	113	221	
						95			10	100	4	173	252	black knot on all
I/3/71-80	'Schubert' 9012608	PRVI	chokecherry <i>Prunus virginiana</i> Lincoln-Oakes Nursery, Bismarck, ND	13-May	86	86	PLBR	10	2	20		15	25	
						87			10	100	4	12	34	
						88			8	80	6	26	52	
						90			10	100	5	55	108	
						92			9	90	5	68	174	
						95			8	80	5	121	226	

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD	NO PLTS	NO SRV	PCT SRV	VI	CAN COV	PLT HT	REMARKS
I/3/81-90	SD-131 9006073 PI-536048	PRPA5	mayday <i>Prunus padus</i> Moody Co., SD USDA, NRCS, PMC, Bismarck, ND	13-May	86	86	PLBR	10	9	90	4	22	53	
						87			4	40	4	16	55	
						88			6	60	6	29	55	
						90			9	90	4	68	96	
						92			6	60	6	110	168	
						95			3	27	6	170	225	black knot on all
I/3/91-100	ND-1134 9047203	PRAM	hardy plum <i>Prunus americana</i> Hand Co., SD USDA, NRCS, PMC, Bismarck, ND	13-May	86	86	CONT	5	3	60		25	47	
						87			1	20	5	30	60	
						88			1	20	1	60	70	
						90			2	40	4	103	125	
						92			2	40	6	135	165	
						95			3	60	4	130	138	
I/3/101-110	ND-3753 9019604	PRAM	plum <i>Prunus americana</i> Lincoln-Oakes Nursery, Bismarck, ND	13-May	86	86	PLBR	10	10	100		24	67	
						87			6	60	5	22	68	
						88			10	100	5	33	61	
						90			8	80	3	114	153	
						92			8	80	3	148	221	
						95			10	100	5	150	208	
I/4/1-10	ND-1729 9005979	LASI	Siberian larch <i>Larix sibirica</i> ND Forest Service, Towner, ND	13-May	86	86	CONT	10	10	100		12	38	
						87			9	90	3	19	44	
						88			9	90	3	28	60	
						90			9	90	5	37	63	
						92			1	10	5	65	90	pocket gophers
						95			1	10	5	130	160	
I/4/11-20	ND-2502 9047223	PIPO	ponderosa pine <i>Pinus ponderosa</i> ND Forest Service, Towner, ND	13-May	86	86	CONT	10	10	100		20	34	
						87			7	70	4	19	35	
						88			7	70	3	35	47	
						90			6	60	2	76	89	
						92			5	50	3	149	156	
						95			5	50	6	247	271	

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD	NO PLTS	NO SRV	PCT SRV	VI	CAN COV	PLT HT	REMARKS
I/4/21-30	ND-3791 9030302	PIAB	Norway spruce <i>Picea abies</i> U of MN, St. Paul, MN	13-May	86	86	CONT	10	10	100		15	32	
						87			4	40	8	5	18	
						88			10	100	5	16	29	
						90			9	90	6	27	41	
						92			8	80	5	45	52	
						95			8	80	4	96	131	
I/4/31-40	9057426	PSME	douglas fir <i>Pseudotsuga menziesii</i> U of MN, St. Paul, MN	13-May	86	86	CONT	10	9	90		13	21	
						87			4	40	3	15	22	
						88			9	90	3	18	26	
						90			3	30	3	42	52	
						92			2	20	3	62	88	
						95			2	20	3	112	178	
I/4/41-50	9057426	PSME	douglas fir <i>Pseudotsuga menziesii</i> U of MN, St. Paul, MN	13-May	86	86	CONT	10	9	90		16	16	
						87			9	90	3	14	19	
						88			10	100	3	20	25	#3,5 Siberian fir
						90			7	70	5	35	41	
						92			4	40	4	58	76	
						95			4	40	4	91	156	
I/4/51-60	ND-1729 9005979	LASI*	Siberian larch <i>Larix sibirica</i> U of MN, St. Paul, MN	13-May	86	86	CONT	10	10	100		17	38	
						87			7	70	5	16	38	
						88			8	80	4	18	51	
						90			8	80	6	25	51	
						92			5	50	3	60	101	
						95			4	40	3	108	200	
I/4/61-70	ND-3787 9030295	THOC2	northern white cedar <i>Thuja occidentalis</i> U of MN, St. Paul, MN	13-May	86	86	CONT	10	9	90		18	30	
						87			3	30	2	12	18	
						88			9	90	3	16	31	
						90			9	90	3	29	53	
						92			9	90	4	60	88	
						95			9	90	3	113	197	

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD	NO PLTS	NO SRV	PCT SRV	VI	CAN COV	PLT HT	REMARKS
I/4/71-80	9057413	PIPO	ponderosa pine <i>Pinus ponderosa</i> Glendive, MT NDFS	3-May	88	88	CONT	10	8	80	3	11	23	
						89			7	70	2	29	40	
						90			5	50	4	42	50	
						92			5	50	3	86	102	
						94			5	50	3	122	172	
						97			5	50	2	181	253	
I/4/91-100	9058862	LALA	tamarack <i>Larix laricina</i> Itasca Co., MN	3-May	90	90		10	10	100	3	33	72	
						91			7	70	4	53	101	
						92			9	90	3	76	133	
						94			8	80	3	123	248	
						96			8	80	4	183	323	lots of cones on 7-9
						99			8	80	3	264	590	
I/4/101-106	9058847	PIMA	black spruce <i>Picea mariana</i> U of MN Cloquet Ctr., Cloquet, MN	27-Apr	89	89	CONT	6	4	67	8	5	18	
						90			3	50	5	23	35	
						91			3	50	5	20	37	
						93			3	50	6	40	53	
						95			2	33	5	45	88	
						98			2	33	6	65	112	
I/4/107-111	9058862	LALA	tamarack <i>Larix laricina</i>	1-Sep	89	90		5	4	80	2	40	94	
						93			1	20		115	175	
						95			1	20	3	120	170	
						98			1	20	7	100	170	
I/5/1-10	'Oahe' PI-476982	CEOC	hackberry <i>Celtis occidentalis</i> USDA, ARS, Mandan, ND USDA, NRCS, PMC, Bismarck, ND	13-May	86	86	PLBR	10	10	100		13	55	
						87			10	100	4	23	68	
						88			10	100	4	33	80	
						90			10	100	5	48	95	
						92			10	100	4	62	101	deer browse on all trees
						95			9	90	7	80	122	

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD	NO PLTS	NO SRV	PCT SRV	VI	CAN COV	PLT HT	REMARKS
I/5/11-20	ND-3756 9019578	CEOC	hackberry <i>Celtis occidentalis</i> Lincoln-Oakes Nursery, Bismarck, ND	13-May	86	86	PLBR	10	9	90	3	16	38	
						87			9	90	4	22	64	
						88			10	100	5	31	75	
						90			9	90	5	53	84	
						92			9	90	4	53	88	deer browse on all trees
						95			8	80	2	71	109	deer browse
I/5/21-30	'Cardan' PI-469226	FRPE	green ash <i>Fraxinus pennsylvanica</i> Lincoln-Oakes Nursery, Bismarck, ND	13-May	86	86	PLBR	10	10	100		16	98	
						87			9	90	4	16	89	
						88			10	100	5	27	89	
						90			9	90	5	91	159	
						92			9	90	4	149	234	
						95			9	90	5	202	323	
I/5/31-40	ND-3757 9019586	FRPE	green ash <i>Fraxinus pennsylvanica</i> Lincoln-Oakes Nursery, Bismarck, ND	13-May	86	86	PLBR	10	10	100		34	86	
						87			9	90	7	15	68	
						88			8	80	9	9	40	
						90			4	40	6	46	93	
						92			4	40	5	91	155	
						95			4	40	5	165	285	
I/5/41-50	ND-3825 9034904	ACSA2	silver maple <i>Acer saccharinum</i> Burleigh Co., ND USDA, NRCS, PMC, Bismarck, ND	13-May	86	86	PLBR	10	10	100		26	80	
						87			10	100	4	40	97	
						88			9	90	5	54	111	
						89			9	90	6	85	129	
						90			9	90	5	106	202	
						92			9	90	4	194	286	
						95			9	90	4	240	333	
I/5/51-60	9063127	FRAM	white ash <i>Fraxinus americana</i> Wisconsin Lincoln-Oakes Nursery, Bismarck, ND	29-Apr	92	92	PLBR	10	10	100	5	24	59	
						93			7	70	4	41	80	
						94			6	60	4	41	82	
						96			2	20	7	40	105	browse, winter kill, gopher
						98			2	20	5	75	115	

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD	NO PLTS	NO SRV	PCT SRV	VI	CAN COV	PLT HT	REMARKS
I/5/61-70	ND-1879 9011850 PI-503531	GLTR	honeylocust <i>Gleditsia triacanthos</i> USDA, ARS, Mandan, ND USDA, NRCS, PMC, Bismarck, ND	13-May	86	86	CONT	10	10	100	3	10	31	
						87			6	60	3	17	39	
						88			6	60	4	18	51	
						90			7	70	5	60	128	
						92			6	60	4	122	234	
						95			6	60	4	238	384	
I/5/86-90	9069089	QURO	English oak <i>Quercus robur</i> TEC, Osseo, MN	29-Apr	93	93	PLBR	5	5	100	4	15	64	
						94			4	80	4	20	90	
						95			4	80	4	40	119	
						97			4	80	3	26	101	
						99			4	80		51	150	
I/5/91-100	9063126	ULJA	Japanese elm <i>Ulmus japonica</i> Manchuria PFRA, Indianhead, Sask.	29-Apr	92	92	CONT	10	10	100	6	22	54	
						93			8	80	5	28	53	
						94			8	80	6	21	58	
						96			7	70	7	47	55	all have heavy browse damage
						97			6	60	7	46	58	
						98			0	0				mowed off
I/6/1-5	9047239	AEGL	Ohio buckeye <i>Aesculus glabra</i> Burleigh Co., ND USDA, NRCS, PMC, Bismarck, ND	13-May	86	86	PLBR	10	9	90		5	17	
						87			7	70	5	5	20	
						88			8	80	4	6	24	
						90			6	60	5	28	50	
						92			4	40	6	41	88	
						95			5	100	7	65	137	
I/6/6-10	9069084	QUAL	white oak <i>Quercus alba</i> Lee Nursery, Fertile, MN	29-Apr	93	93	PLBR	5	5	100	3	*	54	*tree shelter test
						94			4	80	6	32	64	
						95			4	80	5	26	84	
						97			2	40	6	45	85	
						99			2	40	8	15	65	
I/6/11-20	9058864	ACNE2	boxelder <i>Acer negundo</i> Lincoln-Oakes Nursery, Bismarck, ND	13-May	86	86	PLBR	10	10	100		22	65	
						87			9	90	3	60	131	
						88			9	90	3	88	181	
						90			9	90	4	139	276	
						92			9	90	2	212	359	
						95			9	90	5	342	451	

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD	NO PLTS	NO SRV	PCT SRV	VI	CAN COV	PLT HT	REMARKS
I/6/21-30	ND-2105 9047150	MORU	red mulberry <i>Morus rubra</i> Big Stone Co., MN USDA, NRCS, PMC, Bismarck, ND	3-May	88	88	CONT	10	10	100	3	12	37	
						89			10	100	4	33	52	
						90			10	100	3	83	87	
						92			10	100	4	70	82	
						94			10	100	5	130	116	
						97			10	100	4	243	267	
I/6/31-40	9057410	CEOC	hackberry <i>Celtis occidentalis</i> Bottineau Co., ND NDFS	3-May	88	88	CONT	10	7	70	6	7	18	
						89			5	50	4	13	28	
						90			9	90	5	28	41	
						92			8	80	6	23	42	
						94			5	50	5	41	76	
						97			1	10	8	35	70	
I/6/41-45	9069082	QUEL	pin oak <i>Quercus ellipsoidalis</i> Lee Nursery, Fertile, MN	29-Apr	93	93	PLBR	5	4	80	3	*	66	*tree shelter test
						94			5	100	3	24	68	
						95			4	80	4	40	75	
						97			4	80	3	45	80	
						99			4	80	5	56	80	
I/6/46-50	9063116	FRNI	black ash <i>Fraxinus nigra</i> Itasca State Park, MN	25-Apr	95	95	CONT(P)	5	4	80	5	5	46	
						96			5	100	5	11	48	all leaf off
						97			4	80	8	10	50	
						99			4	80	6	16	52	
I/6/51-52	9057405	BEPA	paper birch <i>Betula papyrifera</i> Turtle Mtns., Bottineau, ND NDFS	3-May	88	88	CONT	10	8	80	4	6	60	
						89			6	60	3	24	63	
						90			2	20	2	48	95	
						92			2	20	4	98	180	
						94			1	10		180	400	
						97			1	10	3	280	600	
I/6/53-58	9063129	BEPA	paper birch <i>Betula papyrifera</i> MN Forestry Association	29-Apr	93	93	PLBR	5	3	60	5	22	30	
						94			3	60	4	20	52	
						95			3	60	4	30	90	
						97			3	60	4	50	123	
						99			3	60	4	98	185	

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD	NO PLTS	NO SRV	PCT SRV	VI	CAN COV	PLT HT	REMARKS
I/6/59-64	9063124	GLTR	honeylocust <i>Gleditsia triacanthos</i> Big Sioux Nursery, Watertown, SD	25-Apr	95	95	CONT(P)	5	2	40	5	5	22	
					96	96			2	40	6	20	40	
					97	97			1	20	7	30	45	
					99	99			0	0				
I/6/61-65	Clone C 9058896	SAMA	Austree <i>Salix matsudana x alba</i> Austree, Inc., Pescadero, CA	3-May	90	90	PLBR	5	5	100	2	40	114	
					91	91			4	80	4	64	114	
					92	92			4	80	6	88	122	
					94	94			4	80	6	131	225	
					96	96			1	20		550	780	estimated height
					99	99			1	20	3	820	910	
I/6/71-80	9069081	TICO	littleleaf linden <i>Tilia cordata</i> Lee Nursery, Fertile, MN	29-Apr	93	93	PLBR	5	5	100	5	-	53	*tree shelter test
					94	94			5	100	4	19	64	
					95	95			5	100	6	18	78	
					97	97			4	40	4	39	105	
					99	99			1	10	7	40	80	
I/6/81-90	PI-514677	PRAM	American plum <i>Prunus americana</i> USDA, NRCS, PMC, Manhattan, KS	3-May	90	90	PLBR	10	9	90	4	23	56	
					91	91			8	80	5	16	55	
					92	92			7	70	6	36	60	
					94	94			6	60	6	52	70	
					96	96			6	60	7	54	75	gopher on 1, black knot on 6,7,10
					99	99			4	40	5	60	86	
I/6/91-100	9049970	PRAN	chickasaw plum <i>Prunus angustifolia</i> USDA, NRCS, PMC, Manhattan, KS	3-May	90	90	PLBR	10	8	80	5	28	52	
					91	91			4	40	3	46	55	
					92	92			4	40	4	82	68	
					94	94			4	40	4	89	120	
					96	96			5	50	5	99	139	resprout on 1
					99	99			5	50	5	150	160	
I/6/95-100	9063130	BENI	river birch <i>Betula nigra</i> MN Forestry Association	29-Apr	93	93	PLBR	5	5	100	6	34	56	
					94	94			4	80	4	70	96	
					95	95			2	40	7	108	142	
					97	97			2	40	3	205	290	
					99	99			2	40	4	342	435	

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD	NO PLTS	NO SRV	PCT SRV	VI	CAN COV	PLT HT	REMARKS
I/7/1-10	ND-2470 9047206	PRAR3	apricot <i>Prunus armeniaca</i> Lincoln-Oakes Nursery, Bismarck, ND	13-May	86	86	PLBR	10	10	100		27	64	
I/7/11-20	ND-2102 9036029	PRAR3	apricot <i>Prunus armeniaca</i> Hand Co., SD USDA, NRCS, PMC, Bismarck, ND	13-May	86	86	PLBR	10	10	100		30	58	
I/7/21-25	9063131	ACSA	sugar maple <i>Acer saccharum</i> Sieche Hollow, SD Smith Nursery, Charles City, IA	29-Apr	93	93	PLBR	5	3	60	4	7	32	
I/7/26-30	9063148	PHAM	corktree <i>Phellodendron amurense</i> Clay Co., MN	25-Apr	95	95	CONT(P)	5	4	80	5	5	34	
I/7/31-40	'McDermand' ND-14 PI-478004	PYUS80	Ussurian pear <i>Pyrus ussuriensis</i> Res. Sta., Morden, MB, CA USDA, NRCS, PMC, Bismarck, ND	13-May	86	86	PLBR	10	6	60		20	56	
I/7/41-45	ND-686 PI-478008	SYPE	pekin lilac <i>Syringa pekinensis</i> USDA, NRCS, PMC, Bismarck, ND	13-May	86	86	PLBR	10	7	70		14	34	
						87		3	3	30	6	17	35	
						88		3	3	30	7	27	43	
						90		2	2	20	4	83	83	
						92		2	2	20	4	145	140	
						95		2	2	20	6	92	122	
														1 browsed

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD	NO PLTS	NO SRV	PCT SRV	CAN COV	PLT HT	REMARKS
I/7/46-50	9063115	FRNI	green ash <i>Fraxinus pennsylvanica</i> Itasca State Park, MN	25-Apr	95	95	CONT(S)	5	2	40	5	32	
					96	96			4	80	9	40	
					97	97			5	100	6	43	
I/7/51-60	ND-21	VILE	nannyberry	13-May	86	86	PLBR	10	8	80	14	34	
	9034900		<i>Viburnum lentago</i>		87	87			10	100	3	34	
	PI-560908		USDA, ARS, Mandan, ND		88	88			10	100	5	49	
			USDA, NRCS, PMC, Bismarck, ND		90	90			7	70	3	78	
					92	92			7	70	4	118	
					95	95			6	60	5	162	
I/7/61-70	'Homestead'	CRATA	Arnold hawthorn	3-May	88	88	PLBR	10	0	0			
	ND-20		<i>Crataegus X anomala</i>		89	89			7	70	4	36	
	9005731		Lincoln-Oakes Nursery,		90	90			10	100	5	44	browse
	PI-503530		Bismarck, ND		92	92			5	50	7	25	
					94	94			5	50	6	39	
					97	97			0	0			
I/7/76-80	9069088	PLOC	American sycamore	29-Apr	93	93	PLBR	5	5	100	3	77	tree shelter test
			<i>Platanus occidentalis</i>		94	94			4	80	4	129	
			TEC, Osseo, MN		95	95			4	80	4	174	
					97	97			2	40	5	140	insect problem on 5
					99	99			0	0			
I/7/81-90	'Streamco'	SAPU2	purpleosier willow	13-May	86	86	PLBR	10	8	80	21	52	
	PI-434309		<i>Salix purpurea</i>		87	87			5	50	4	70	
			USDA, NRCS, PMC, Big Flats, NY		88	88			3	30	4	87	
					90	90			10	100	3	115	
					92	92			7	70	4	187	
					95	95			6	60	5	271	
II/1/1-20	9031856	VITR8	American cranberrybush	14-May	86	86	PLBR	20	20	100	11	19	
			<i>Viburnum trilobum</i>		87	87			7	35	3	28	
			USDA, NRCS, PMC, East Lansing, MI		88	88			11	55	5	30	
					90	90			10	50	2	47	
					92	92			9	45	6	69	
					95	95			9	45	6	93	

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD	NO PLTS	NO SRV	PCT SRV	VI	CAN COV	PLT HT	REMARKS
II/2/1-20	'Sakakawea' PI-478005	SHAR	silver buffaloberry <i>Shepherdia argentea</i> Res. Sta., Morden, MB, CA USDA, NRCS, PMC, Bismarck, ND	14-May	86	86	PLBR	20	17	85	4	16	36	
II/3/11-20	Survivor Germplasm 9047236	AMFR	false indigo <i>Amorpha fruticosa</i> Lincoln-Oakes Nursery, Bismarck, ND	11-May	87	87	PLBR	10	8	80	4	26	36	
II/3/21-30	Silver Sands Germplasm 9008041	AMFR	false indigo <i>Amorpha fruticosa</i> USDA, NRCS, PMC, Aberdeen, ID	11-May	87	87	PLBR	10	10	100	3	58	50	
II/3/31-50	ND-3764 9019619	SHAR	silver buffaloberry <i>Shepherdia argentea</i> Lincoln-Oakes Nursery, Bismarck, ND	14-May	86	86	PLBR	20	19	95		14	46	
II/4/1-20	'Legacy' ND-83 9006228 PI-540443	SYVI80	late lilac <i>Syringa villosa</i> Lincoln-Oakes Nursery, Bismarck, ND	14-May	86	86	PLBR	20	20	100		20	30	
						87			19	95	5	24	27	
						88			20	100	5	39	46	
						90			19	95	3	79	75	
						92			19	95	4	118	113	
						95			17	85	4	134	133	

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD PLBR	NO PLTS	NO SRV	PCT SRV	VI	CAN COV	PLT HT	REMARKS
II/4/21-40	ND-3763 9019611	RIOD	golden currant <i>Ribes odoratum</i> Lincoln-Oakes Nursery, Bismarck, ND	14-May	86	86	PLBR	20	20	100		11	38	
						87			17	85	5	18	44	
						88			20	100	6	35	57	
						90			20	100	4	83	90	
						92			20	100	5	99	101	
						95			20	100	6	79	110	
II/4/41-60	ND-3744 9019577	BEKO	Korean barberry <i>Berberis koreana</i> NDSU McKenzie FEP, ND	3-May	88	88	CONT	20	9	45	5	8	18	
						89			12	60	4	12	25	
						90			11	55	4	17	31	
						92			12	60	5	27	48	
						94			12	60	3	21	52	grass competition
						97			12	60	4	18	60	
II/5/1-8	ND-2507 9047228	CAPY	pigmy caragana <i>Caragana pygmaea</i> NDFS, Bottineau, ND USDA, NRCS, PMC, Bismarck, ND	3-May	88	88	CONT	8	4	50	6	5	21	
						89			6	75	4	8	22	
						90			3	38	6	13	28	
						92			1	11	9	25	30	
						94			2	25	2	22	60	
						97			3	30	6	20	55	
II/5/9-20	'Meadowlark' 9005886	FOOV	forsythia <i>Forsythia ovata</i> x <i>europaea</i> NDSU Lee Nursery, Fertile, MN	27-Apr	89	89	PLBR	12	11	92	3	11	18	
						90			12	100	3	30	30	
						91			12	100	5	40	50	
						93			12	100	4	53	80	
						95			12	100	4	65	120	
						98			11	92	4	111	171	
II/5/21-40	ND-2103 PI-399414	VIOP	highbush cranberry <i>Viburnum opulus</i> NDSU Exp. Sta., Dickinson, ND	3-May	88	88	CONT	20	7	35	6	14	18	
						89			3	15	6	15	15	
						90			2	10	4	18	15	
						92			2	10	5	40	48	
						94			2	10	3	22	78	grass competition
						97			2	10	5	30	90	

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD	NO PLTS	NO SRV	PCT SRV	VI	CAN COV	PLT HT	REMARKS
II/5/41-60	PI-323957	PHME13	chokeberry <i>Photinia melanocarpa</i> USDA, NRCS, PMC, Bismarck, ND	3-May	88	88	CONT	20	17	85	6	6	15	
						89			18	90	7	11	22	
						90			17	85	4	19	33	
						92			19	95	6	32	44	
						94			19	95	3	30	48	
						97			19	95	6	22	48	heavy grass competition
II/6/1-20	'Hedge King' 9057407	LOXY	honeysuckle <i>Lonicera xylosteoides</i> Wedge Nursery, Albert Lea, MN	3-May	88	88	CONT	20	9	45	7	15	11	
						89			18	90	4	19	28	
						90			18	90	5	19	27	
						92			17	85	5	31	39	
						94			15	75	2	39	51	
						97			15	75	6	20	54	
II/6/21-40	9057409	COAM	American hazel <i>Corylus americana</i> Turtle Mtns., Bottineau Co., ND	3-May	88	88	CONT	20	18	90	5	14	40	
						89			20	100	4	24	45	
						90			16	80	4	22	46	
						92			17	85	5	29	46	
						94			11	55	3	43	66	
						97			13	65	6	38	69	
III/1A/16-20	9069086 Theves	POPUL	hybrid poplar <i>Populus</i> PFRA, Indianhead, Sask.	29-Apr	93	93	PLBR	5	4	80	3	8	51	fabric mats
						94			4	80	3	31	88	
						95			4	80	2	34	129	
						97			0	0				
						98			1	20	1	40	65	
III/1A/21-25	9069090	POTR	quaking aspen <i>Populus tremuloides</i> Lee Nursery, Fertile, MN	29-Apr	93	93	PLBR	5	5	100	4	7	38	fabric mats
						94			5	100	4	17	52	
						95			5	100	5	24	77	
						97			0	0				
						98			4	80	6	52	139	
						99			3	60	7	50	147	

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD	NO PLTS	NO SRV	PCT SRV	VI	CAN COV	PLT HT	REMARKS
III/1/1-10	'Imperial' PI-432347	POCA19	carolina poplar <i>Populus x canadensis</i> USDA, NRCS, PMC, East Lansing, MI	14-May	86	86	PLBR	10	10	100		24	78	
						87			10	100	4	44	112	
						88			10	100	2	65	165	
						90			10	100	1	151	381	
						92			9	90	3	224	614	
						95			9	90	3	249	951	
III/1/11-20	ND-3781 9029136	POPUL	robusta poplar <i>Populus robusta</i> Lincoln-Oakes Nursery, Bismarck, ND	14-May	86	86	PLBR	10	10	100		26	88	
						87			10	100	4	36	122	
						88			10	100	3	74	160	
						90			9	90	2	170	408	
						92			9	90	4	227	648	
						95			9	90	3	286	940	
III/1/21-30	'Siouxland' 9016288	PODE3	eastern cottonwood <i>Populus deltoides</i> Lincoln-Oakes Nursery, Bismarck, ND	14-May	86	86	PLBR	10	10	100		29	92	
						87			10	100	4	45	132	
						88			9	90	2	88	167	
						90			9	90	2	192	398	
						92			9	90	4	273	683	canker
						95			9	90	3	333	962	
III/1/31-40	ND-3803 90306112	POAL7	white poplar <i>Populus alba</i> Turner Co., SD USDA, NRCS, PMC, Bismarck, ND	14-May	86	86	CONT	5	5	100		29	46	
						87			4	80	5	25	60	
						88			4	80	4	63	86	
						90			4	80	2	200	458	
						92			4	80	4	314	325	
						95			4	80	2	473	600	
III/2/1-10	ND-3780 9029135	POPUL	Norway poplar <i>Populus canadensis</i> Lincoln-Oakes Nursery, Bismarck, ND	14-May	86	86	PLBR	10	10	100		24	75	
						87			10	100	5	40	114	
						88			10	100	3	68	147	
						90			10	100	2	167	404	
						92			10	100	2	242	678	canker on 1-4
						95			10	100	2	278	1012	

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD	NO PLTS	NO SRV	PCT SRV	VI	CAN COV	PLT HI	REMARKS
III/2/11-20	ND-3768 9019603	PDXP8	Northwest poplar <i>Populus deltoides</i> X <i>P. balsamifera</i> Lincoln-Oakes Nursery, Bismarck, ND	14-May	86	86	PLBR	10	10	100	5	16	46	
						87			10	100		20	56	
						88			8	80	4	37	90	
						90			7	70	3	163	246	
						92			7	70	3	199	320	
						95			7	70	2	226	477	
III/2/21-30	ND-3773 9021576	SALIX	willow <i>Salix</i> Twin Valley, MN USDA, NRCS, PMC, Bismarck, ND	14-May	86	86	CONT	10	10	100		41	91	
						87			10	100	3	46	94	
						88			10	100	3	69	101	
						90			10	100	3	164	185	
						92			10	100	3	238	241	
						95			10	100	3	307	407	
III/3/1-5	14271 9058869	PDXP8	poplar <i>Populus deltoides</i> x <i>nigra</i> USDA, ARS, Mandan, ND Lincoln-Oakes Nursery, Bismarck, ND	2-May	91	91	PLBR	5	5	100	4	22	95	
						92			5	100	4	40	116	
						93			5	100	3	35	128	
						95			5	100	6	46	156	
						97			4	80	7	41	165	
III/3/6-10	14272 9058870	PDXP8	poplar <i>Populus deltoides</i> x <i>nigra</i> USDA, ARS, Mandan, ND Lincoln-Oakes Nursery, Bismarck, ND	2-May	91	91	PLBR	5	5	100	4	18	95	
						92			5	100	4	42	125	
						93			5	100	3	35	148	
						95			5	100	6	65	193	
						97			5	100	5	77	225	
III/3/11-15	14273 9058871	PDXP8	poplar <i>Populus deltoides</i> x <i>nigra</i> USDA, ARS, Mandan, ND Lincoln-Oakes Nursery, Bismarck, ND	2-May	91	91	PLBR	5	5	100	4	23	80	
						92			5	100	4	54	102	
						93			5	100	3	63	152	
						95			5	100	3	104	288	
						97			5	100	3	98	358	
III/3/16-20	14274 9058872	PDXP8	poplar <i>Populus deltoides</i> x <i>nigra</i> USDA, ARS, Mandan, ND Lincoln-Oakes Nursery, Bismarck, ND	2-May	91	91	PLBR	5	4	80	4	25	101	
						92			5	100	4	51	132	
						93			5	100	3	53	161	
						95			5	100	4	114	271	
						97			5	100	3	149	487	

Year of Record: 1998-1999

PLOT LOCATION	ACCESSION NUMBER	PLANT SYMBOL	GENUS/SPECIES ORIGIN/SOURCE	TRANS DATE	YR PLT	YR REC	MATL PLTD	NO PLTS	NO SRV	PCT SRV	VI	CAN COV	PLT HT	REMARKS
III/3/21-25	14390	PDXP8	poplar	2-May	91	91	PLBR	5	3	60	3	22	105	
	9058873		Populus			92			5	100	4	55	110	
	Walker		USDA, ARS, Mandan, ND			93			5	100	4	68	135	
			Lincoln-Oakes Nursery, Bismarck, ND			95			5	100	5	123	241	
						97			4	80	3	146	394	
III/4/11-15	9058899		Austree	2-May	91	91	CONT	5	5	100	3	20	119	
			Salix matsudana x alba			92			5	100	5	44	93	
			Austree, Inc., Pescadero, CA			93			5	100	3	73	103	severe deer browse
						95			5	100	5	127	257	
						97			5	100	4	170	402	
IV/1/11-10	Mich-433	SAPE4	laurel willow	14-May	86	86	CONT	10	10	100		38	72	
	9005049		Salix pentandra			87			9	90	3	34	78	
			USDA, NRCS, PMC, East Lansing, MI			88			8	80	4	39	80	
			USDA, NRCS, PMC, Bismarck, ND			90			8	80	4	114	140	
						92			8	80	8	189	200	
IV/1/11-20	9057448	SAPE4	laurel willow	14-May	86	86	PLBR	10	10	100		31	46	
			Salix pentandra			87			10	100	6	30	50	
			Lincoln-Oakes Nursery, Bismarck, ND			88			8	80	5	43	48	
						90			8	80	3	124	142	
						92			7	70	3	214	230	
IV/1/21-30	ND-3769	SAALV	golden willow	14-May	86	86	PLBR	10	10	100		33	66	
	9019614		Salix alba vitellina			87			10	100	4	30	72	
			Lincoln-Oakes Nursery, Bismarck, ND			88			10	100	5	39	74	
						90			10	100	4	74	113	
						92			9	90	6	118	136	3 have dieback
						95			8	80	5	155	262	
														corrected height

Year of Record: 1998-1999

<u>PLOT</u> <u>LOCATION</u>	<u>ACCESSION</u> <u>NUMBER</u>	<u>PLANT</u> <u>SYMBOL</u>	<u>GENUS/SPECIES</u> <u>ORIGIN/SOURCE</u>	<u>TRANS</u> <u>DATE</u>	<u>YR</u> <u>PLT</u>	<u>YR</u> <u>REC</u>	<u>MATL</u> <u>PLTD</u>	<u>NO</u> <u>PLTS</u>	<u>NO</u> <u>SRV</u>	<u>PCT</u> <u>SRV</u>	<u>VI</u>	<u>CAN</u> <u>COV</u>	<u>PLT</u> <u>HT</u>		<u>REMARKS</u>
IV/2/1-10	9057447	SAALC	red stem willow <i>Salix alba chermesina</i> Lincoln-Oakes Nursery, Bismarck, ND	14-May	86	86	PLBR	10	10	100	4	34	71	84	
						87									
						88									
						90									
						92									
						95			4	40	2	252	635		
IV/2/11-20	ND-3772 9019613	SAAL2	white willow <i>Salix alba</i> Lincoln-Oakes Nursery, Bismarck, ND	14-May	86	86	PLBR	10	8	80	5	41	51	67	
						87									
						88									
						90									
						92									
						95			9	90	4	261	445		
IV/3/1-10	9047242	SAAC*	sharpleaf willow <i>Salix acutifolia</i> Lincoln-Oakes Nursery, Bismarck, ND	14-May	86	86	PLBR	10	8	80	6	41	51	61	
						87									
						88									
						90									
						92									
						95			7	70	4	236	285		

NATIONAL AGRICULTURAL LIBRARY



1022500648

* NATIONAL AGRICULTURAL LIBRARY



1022500648